CLAIMS

1. An optical recording method for directing a recording pulse train to an optical disc medium to form marks thereon and for recording information as information about the edge positions of said marks and the spaces between marks, the recording pulse train having been created by modulating laser light into plural power levels, wherein the method comprises:

coding to-be-recorded data into coded data consisting of the combination of marks and spaces;

classifying said marks within said coded data on the basis of the mark length and the preceding or succeeding space lengths of the marks;

shifting the position of the second pulse edge counted from the end portion of the recording pulse train for forming said marks, depending on the result of said classification, to adjust said recording pulse train; and

directing said recording pulse train to the optical disc medium to form said marks thereon.

2. The optical recording method according to Claim 1, wherein in the course of the step of adjusting said recording pulse train, shifting the position of the second pulse edge of said recording pulse train which is counted from the starting end portion thereof, depending on the result of said classification.

3. The optical recording method according to Claim 1 or 2, wherein in the course of the step of adjusting said recording pulse train, shifting the position of the second pulse edge of said recording pulse train which is counted from the ending end portion thereof, depending on the result of said classification.

4. The optical recording method according to any one of Claims 1 to 3, wherein in the course of the step of adjusting said recording pulse train, further shifting the position of the pulse edge at the ending end portion of said recording pulse train, depending on the result of said classification.

5. The optical recording method according to any one of Claims 1 to 4, wherein in the course of the step of adjusting said recording pulse train, further shifting the position of the pulse edge at the starting end portion of said recording pulse train, depending on the result of said classification.

6. The optical recording method according to any one of Claims 1 to 5, wherein said recording pulse train for recording said marks includes five or more pulse edges.

7. The optical recording method according to Claim 6, wherein in the course of the step of adjusting said recording pulse train, further shifting the position of the third pulse edge of said recording pulse train which is counted from the ending end portion thereof, depending on the result of said classification.

8. The optical recording method according to Claim 6 or 7, wherein in the course of the step of adjusting said recording pulse train, further shifting the position of the third pulse edge of said recording pulse train which is counted from the starting end portion thereof, depending on the result of said

classification.

9. The optical recording method according to any one of Claims 1 to 8, wherein said recording pulse train is created by modulating the laser light with at least three power values which are a first power, a second power and a third power in order of intensity.

10. The optical recording method according to any one of Claims 1 to 9, wherein in the course of the step of classifying said marks, further classifying the mark lengths of said marks into at least three types of mark lengths n, n+1 and n+2 and more (n: a positive integer).

11. The optical recording method according to any one of Claims 1 to 10, wherein in the course of the step of classifying said marks, further classifying the space lengths preceding or succeeding said marks into at least two types of space lengths n and n+1 and more (n: a positive integer).

12. The optical recording method according to any one of Claims 1 to 10, wherein in the course of the step of classifying said marks, further classifying the space lengths preceding or succeeding said marks into at least four types of space lengths n, n+1, n+2 and n+3 and more (n: a positive integer).

13. The optical recording method according to any one of Claims 1 to 10, wherein the step of classifying said marks comprises:

classifying the mark lengths of said marks into at least three types of

mark lengths n, n+1 and n+2 and more (n: a positive integer);

classifying the preceding or succeeding space lengths into at least four types of space n, n+1, n+2 and n+3 and more for the mark length n of said marks; and

classifying the preceding or succeeding space lengths into at least two types of space lengths n and n+1 and more for the mark lengths n+1 and n+2 and more of said marks.

14. The optical recording method according to any one of Claims 1 to 13, wherein in the course of the step of adjusting said recording pulse train, further adjusting said recording pulse train by referring to a recording compensating table defining the amounts of edge shifts in association with the combinations of the mark lengths and the preceding or succeeding space lengths of said marks.

15. The optical recording method according to Claim 14, further comprising:

classifying said marks on the basis of the combination of said mark length and the preceding or succeeding space lengths and performing test writing of classified said marks;

reproducing said test-written marks and spaces to generate reproducing signals; and

creating a table defining the amounts of edge shifts in association with the combinations of the mark lengths and the preceding or succeeding space lengths of said marks, on the basis of said reproducing signals.

16. The optical recording method according to Claim 15, wherein in the

course of the step of performing test writing of said marks, further performing recording with a recording code row including a row of codes having said mark lengths of n+1 and more and performing recording with a recording code row including a row of codes having code lengths of n and more during said test writing.

17. An optical recording apparatus for directing a recording pulse train to an optical disc medium to form marks thereon and for recording information as information about the edge positions of said marks and the spaces between marks, the recording pulse train having been created by modulating laser light into plural power levels, the apparatus comprising:

coding unit operable to code to-be-recorded data into coded data consisting of the combination of marks and spaces;

classifying unit operable to classify said marks within said coded data on the basis of the combination of the mark length and the preceding or succeeding space lengths;

recording waveform generator operable to create a recording pulse train for creating said marks in which the position of the second pulse edge counted from the end portion thereof has been shifted depending on the result of said classification; and

laser driving unit operable to direct said recording pulse train to the optical disc medium to form said marks thereon.

18. The optical recording apparatus according to Claim 17, further comprising a recording compensating portion for storing a recording

compensating table defining the amount of edge shift by which the position of the second pulse edge of said recording pulse train which is counted from the end portion thereof is to be shifted, depending on the result of said classification.

19. The optical recording apparatus according to Claim 18, wherein said recording waveform generator reads said amount of edge shift corresponding to the result of classification of said marks from said recording compensating table and creates said recording pulse train.

20. The optical recording apparatus according to any one of Claims 17 to 19, wherein said recording waveform generator shifts the position of the second pulse edge of said recording pulse train which is counted from the starting end portion thereof, depending on the result of said classification.

21. The optical recording apparatus according to any one of Claims 17 to 20, wherein said recording waveform generator shifts the position of the second pulse edge of said recording pulse train which is counted from the ending end portion thereof, depending on the result of said classification.

22. The optical recording apparatus according to any one of Claims 17 to 21, wherein said recording waveform generator further shifts the position of the pulse edge at the ending end portion of said recording pulse train, depending on the result of said classification.

23. The optical recording apparatus according to any one of Claims 17 to 22,

wherein said recording waveform generator further shifts the position of the pulse edge at the starting end portion of said recording pulse train, depending on the result of said classification.

24. The optical recording apparatus according to any one of Claims 17 to 23, wherein said recording pulse train for recording said marks includes five or more pulse edges.

25. The optical recording apparatus according to Claim 24, wherein said recording waveform generator further shifts the position of the third pulse edge of said recording pulse train which is counted from the ending end portion thereof, depending on the result of said classification.

26. The optical recording apparatus according to Claim 24 or 25, wherein said recording waveform generator further shifts the position of the third pulse edge of said recording pulse train which is counted from the starting end portion thereof, depending on the result of said classification.

27. The optical recording apparatus according to any one of Claims 17 to 26, wherein said recording waveform generator creates said recording pulse train by modulating the laser light with at least three power values which are a first power, a second power and a third power in order of intensity.

28. The optical recording apparatus according to any one of Claims 17 to 27, wherein said classifying unit classifies the mark lengths of said marks into at

least three types of mark lengths n, n+1 and n+2 and more (n: a positive integer).

29. The optical recording apparatus according to any one of Claims 17 to 28, wherein said classifying unit classifies the space lengths preceding or succeeding said marks into at least two types of space lengths n and n+1 and more (n: a positive integer).

30. The optical recording apparatus according to any one of Claims 17 to 28, wherein said classifying unit classifies the space lengths preceding or succeeding said marks into at least four types of space lengths n, n+1, n+2 and n+3 and more (n: a positive integer).

31. The optical recording apparatus according to any one of Claims 17 to 27, wherein said classifying unit classifies the mark lengths of said marks into at least three types of mark lengths n, n+1 and n+2 and more (n: a positive integer); and

said classifying unit classifies the preceding or succeeding space lengths into at least four types of space lengths n, n+1, n+2 and n+3 and more for the mark length n of said marks and classifies the preceding or succeeding space lengths into at least two types of space lengths n and n+1 and more for the mark lengths n+1 and n+2 and more of said marks.